

## Structures, Processes, and Responses of Plants

### 6-2 The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)

#### 6.2.2 Recognize the hierarchical structure of the classification (taxonomy) of organisms (including the seven major levels or categories of living things—kingdom, phylum, class, order, family, genus, and species).

**Taxonomy level:** 1.1-A Remember Factual Knowledge

**Previous/Future knowledge:** In 4<sup>th</sup> grade (4-2.1), students classified organisms into two major groups: plants and animals according to their physical characteristics. There will be additional study about protists and bacteria in 7<sup>th</sup> grade.

**It is essential for students to know** that to study all of the organisms on Earth, biologists have devised ways of naming and classifying them according to their similarities in structures.

- The study of how scientists classify organisms is known as *taxonomy*.
- The modern classification system uses a series of levels to group organisms.
- An organism is placed into a broad group and is then placed into more specific groups based its structures.
- The levels of classification, from broadest to most specific, include: kingdom, phylum, class, order, family, genus, and species.
- The more classification levels an organism shares with another, the more characteristics they have in common.

#### *Kingdom*

- While scientists currently disagree as to how many kingdoms there are, most support a five-kingdom (Plants, Animals, Fungi, Protists, Monerans) system.
- Organisms are placed into kingdoms based on their ability to make food and the number of cells in their body.

#### *Phylum (pl. phyla)*

- In the Plant Kingdom, phyla are sometimes referred to as *divisions*.
- Plants are normally divided into two groups: vascular and nonvascular.
- In the Animal Kingdom, there are 35 different phyla. These phyla can be divided into two groups: vertebrates and invertebrates.

#### *Class, Order, Family*

- These levels become even more specific and will include fewer organisms that have more in common with each other as they move down the levels.

#### *Genus (pl. Genera)*

- Contains closely related organisms.
- The genus is used as the first word in an organism's scientific name.

#### *Species*

- Consists of all the organisms of the same type which are able to breed and produce young of the same kind.
- The species is used as the second word in an organism's scientific name.

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#### *Scientific name*

- The scientific name of an organism is made up of its genus and species.
- It is written in italics (*Genus species*) with the genus capitalized.
- For example, *Canis lupus* is the scientific name for the wolf and *Pinus taeda* is the scientific name for a loblolly pine.

**It is not essential for students to** know any more detail about fungi, protists, or Monerans beyond the major characteristics listed above. Students will study in detail the structures, processes and responses in plants (6-2) and animals (6-3). Students do not need to use binomial nomenclature to determine the scientific name of an organism.

#### **Assessment Guidelines:**

The objective of this indicator is to *recognize* the hierarchical structure of the classification of organisms; therefore, the primary focus of assessment should be to remember the classification scheme for organisms. However, appropriate assessments should also require students to *recall* characteristics of each level of organization that determines which organisms are placed within it; or *identify* an appropriate example of a scientific name.